

90288

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Anthony E. Faltesek, et al.

Art Unit: 2615

Serial No.: 10/716,157

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For: AUTOMATIC AUDIO SYSTEMS
FOR FIRE DETECTION AND
DIAGNOSIS, AND CREW AND
PERSON LOCATING DURING
BURNING FIRES

Examiner: Lee, P.

Attorney
Docket No.: 90288

SUPPLEMENTAL APPELLANT'S BRIEF UNDER 37 CFR §1.192

Mail Stop: Appeal Brief
Commissioner for Patents
P.O. Box 1450
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Sir:

In response to the final rejection of December 26, 2007 and in support of the applicant's Notice of Appeal filed March 6, 2008, the applicant requests consideration of the following:

I. Real Party in Interest.

The real party in interest is Honeywell International, Inc. by assignment recorded at reel/frame 015236/0475.

II. Related Appeals and Interferences.

None.

III. Status of Claims.

Claims 1, 2, 6, 7, 9-11, 25 and 27 stand rejected under 35 U.S.C. 103(a) as being obvious over U.S. Pat. No. 4,709,330 to Yokoi et al. in view of UK Pat. No. GB 2 299 668 to Appleby et al. Claims 8, 14, 16, 28 and 29 stand rejected under 35 U.S.C. §103(a) as being obvious over Yokoi et al. in view of Appleby et al. and U.S. Pat. Appl. No. US 2006/295346 to Markowitz et al. Claims 3-5, 12, 13, 15, 17-24, 26 and 30-33 have been canceled. The rejection of claims 1, 2, 6, 7, 8, 9-11, 14, 16, 25, 27, 28 and 29 are involved in the appeal.

IV. Status of Amendments.

The claims have not been amended since the final Office Action of December 26, 2007.

V. Summary of Claimed Subject Matter.

The claimed invention is directed to a system and method for detecting environmental or alarm conditions based upon sound. More specifically, the claimed invention is directed to “An automatic system that recognizes the sound of fire” (specification, page 3, first full paragraph).

Claim 1 is limited to “A system.” The system is described throughout the specification (e.g., specification, page 3, first full paragraph) and is shown in FIG. 1 and 2.

Claim 1 is further limited to “a plurality of audio modules.” A “plurality of audio

units, corresponding to the audio unit 10, namely A11 . . . A1t . . . Apt” is discussed on page 7 in the second full paragraph and is shown in FIG. 2.

Claim 1 is further limited to “at least one module of the plurality of audio modules including at least one audio output transducer and at least one audio input transducer.” An audio module 10 having a speaker 12 and a microphone 14 is discussed on page 6 in the second full paragraph and is shown in FIG. 1 of the specification.

Claim 1 is further limited to “a common control unit in communication with the plurality of audio modules.” A monitoring system 30, including control circuitry 32 is described on page 7 in the third full paragraph of the specification as being in communication with the audio units A11 . . . Apt.

Claim 1 is further limited to “an output device coupled to the control unit, the control unit presents at least audio information received at various of the modules, via the output device, with the presented audio indicative of the presence of individuals or selected environmental conditions in the vicinity of the respective module.” Page 6, first full paragraph, discusses and FIG. 2 shows an audio output device 36 incorporated into system 30. Page 7, third full paragraph, discusses the use of exemplary circuits 40 for selective switching of audio output to output device 36 from audio circuits Aii. The use of the common processing unit for pick up of information from various of the modules and presentation to an incident commander is discussed on page 4 in the third full paragraph.

Claim 1 is further limited to a system “which includes at least one of circuitry or software to automatically analyze audio of characteristic sounds emitted by a fire and received at the control unit with respect to at least one fire signature, to establish if an alarm condition is present in

the vicinity of at least one of the modules.” Profile recognition software executing on a processor 32 for recognizing a fire condition is discussed on page 8 in the third full paragraph of the specification. The audio signatures emitted by different types of fires and stored in the common processing unit are discussed on page 3 in the fourth full paragraph of the specification.

Claim 2 further limits claim 1 to a system “which includes an audio input device, at the control unit for transmitting audio messages to be output by transducers in at least some of the audio modules.” FIG. 2 shows an audio input device, such as a microphone 38, and the paragraph bridging pages 7 and 8 discusses the transmission of input audio “to a selected one or more of the audio units Aii as, for example, would be the case in a public address system.”

Claims 3-5 have been canceled.

Claim 6 further limits claim 1 to a system “which includes at least one of circuitry or software to identify the at least one audio input transducer.” Page 3, third full paragraph, discusses the identification of microphones. Page 8, first full paragraph discusses selectively obtaining inputs from any of the audio units by the systems 30.

Claim 7 further limits claim 1 to a system “which includes at least one of circuitry or software to filter fire related noise if combined with voice.” A filter for filtering fire sounds is discussed on page 4 in the second full paragraph of the specification.

Claim 8 further limits claim 1 to a system “which includes speech recognition software for processing received audio.” Speech recognition software is discussed on page 8 in the third full paragraph of the specification.

Claim 9 further limits claim 1 to a system “where at least some of the plurality of modules include thermal sensors.” The use of thermal sensors 20 scattered throughout the region R

is discussed on page 9 in the first full paragraph of the specification.

Claim 10 further limits claim 9 to a system “including software for processing thermal related signals received from at least some of the thermal sensors of the plurality of modules.” Profile recognition software is discussed on page 8 in the third full paragraph and the storing of thermal related signals is discussed on page 9 in the first full paragraph of the specification.

Claim 11 is limited to “A method of monitoring a region.” A method of monitoring a region is discussed on page 3 starting with the first full paragraph and continuing until the first full paragraph of page 4.

Claim 11 is further limited to “sensing audio signals from spaced apart locations in the region.” The sensing of sounds through the microphones is discussed on page 6 in the first full paragraph of the specification.

Claim 11 is further limited to “automatically analyzing the sensed audio signals and responsive to recognizing an audio fire signature of characteristic sounds emitted by a fire, displaying locations of origination therefore.” The analyzing of audio signals from microphones from spaced apart location is discussed on page 5 in the first full paragraph of the specification. The automatic system for recognition of sound is discussed on page 3 in the first full paragraph. The analysis of microphone output using the automatic system is discussed on page 4 in the first full paragraph and on page 5 in the first full paragraph of the specification . The audio fire signatures of different types of fires are discussed on page 3 in the fourth full paragraph. A discussion of the locations and progression of a fire and displaying images thereof is provided on page 8, last full paragraph, of the specification.

Claims 12 and 13 have been canceled.

Claim 14 further limits claim 11 to the method “which includes recognizing sounds of individuals at one or more locations in the regions.” A discussion of the recognition of sounds of individual at one or more location is provided on page 4 in the third full paragraph of the specification.

Claim 15 has been canceled.

Claim 16 further limits claim 11 to the method “which includes suppressing fire sounds from at least some of the sensed audio signals in order to more effectively recognize other sources of sound.” The filtering or suppression of fire sounds is discussed on page 4 in the second full paragraph of the specification.

Claims 17-24 have been canceled.

Claim 25 is limited to “A system.” An automatic system is discussed on page 3 in the first full paragraph of the specification.

Claim 25 is further limited to “a plurality of audio input transducers.” A “plurality of audio units, corresponding to the audio unit 10, namely A11 . . . A1t . . . Apt” are discussed on page 7 in the second full paragraph and are shown in FIG. 2.

Claim 25 is further limited to “at least one audio output transducer.” An audio module 10 having a speaker 12 are discussed on page 6 in the second full paragraph and are shown in FIG. 1 of the specification.

Claim 25 is further limited to “a control unit in communication with the output transducer and the plurality of input transducers.” A monitoring system 30, including control circuitry 32 is described on page 7 in the third full paragraph of the specification as being in

communication with the audio units A11 . . . Apt.

Claim 25 is further limited to “a user interface device coupled to the control unit.”

Page 7, third full paragraph, discusses the monitoring system 30 as having a user interface coupled to it.

Claim 25 is further limited to the context wherein “the control unit presents at least location related audio information, received at various input transducers, via the interface device with the presented audio indicative of the presence of individuals or certain environmental conditions in the vicinity of the respective module.” Page 8, second full paragraph, discusses the system 30 presenting location related audio information received at various locations “to diagnose fires, locate and rescue individuals.”

Claim 25 is further limited to the context “where the control unit analyzes and evaluates received audio of characteristic sounds emitted by a fire with respect to at least one fire signature.” The analysis of audio is discussed on page 5 in the first full paragraph. Page 8, third full paragraph discusses a processor 32 incorporating profile recognition software. FIG. 2 shows the processor 32 as being within the control unit 30. Page 3, fourth full paragraph, and page 4, first full paragraph, discuss the audio signatures of different types of fires and the comparison of profiles with sounds emitted by a fire.

Claim 26 has been canceled.

Claim 27 further limits claim 25 to the system “where the control unit uniquely identifies each of the audio input transducers.” Page 3, third full paragraph discusses the identification of microphones.

Claim 28 further limits claim 25 to the system “where the control unit suppresses fire

sounds in order to more effectively detect human voice.” The filtering or suppression of fire sounds to detect human voices is discussed on page 4 in the second full paragraph of the specification.

Claim 29 further limits claim 25 to the system “which includes speech recognition software for processing received audio.” Speech recognition software for processing received audio is discussed on page 8 in the third full paragraph of the specification.

Claims 30-33 have been canceled.

VI. Grounds of Rejection to be Reviewed on Appeal.

The rejection of claims 1, 2, 6, 7, 9-11, 25 and 27 under 35 U.S.C. 103(a) as being obvious over U.S. Pat. No. 4,709,330 to Yokoi et al. in view of UK Pat. No. GB 2 299 668 to Appleby et al. is appealed. The rejection of claims 8, 14, 16, 28 and 29 under 35 U.S.C. §103(a) as being obvious over Yokoi et al. in view of Appleby et al. and U.S. Pat. Appl. No. US 2006/295346 to Markowitz et al. is appealed.

VII. Argument.

A. Claims 1, 2, 6, 7, 9-11, 25 and 27 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Pat. No. 4,709,330 to Yokoi et al. in view of U.K. Pat. No. GB 2 299 668 to Appleby et al. It may be noted in this regard that claims 1, 11 and 25 are limited to audio “characteristic sounds emitted by a fire.”

Claims 1, 2, 6, 7, 9-11, 25 and 27 are clearly differentiated over the combination of Yokoi et al. and Appleby et al. For example, Yokoi et al. uses “a fire detection sensor 5 which may be a heat sensor of a differential, compensating or constant temperature type, a smoke sensor of an

ionic or photoelectric type, or an oxygen sensor of ceramic type for detecting an oxygen concentration” (Yokoi et al., col. 2, lines 63-67). As such, Yokoi et al. fails to provide any teaching or suggestion of sounds emitted by a fire.

Similarly, Appleby et al. merely uses an ultrasonic transducer 5 for emitting ultrasonic waves and an ultrasonic transducer 6 for receiving “ultrasonic sound waves . . . which varies as a function of modifications . . . of the emitted sound waves by . . . the presence of a fire” (Appleby, page 2, lines 10-17). Since the Appleby et al. ultrasonic waves are simply modified in the presence of a fire, it is clear that Appleby et al. does not operate in the same way and does not produce the same result as that of the claimed invention.

It is also clear that it would not require a fire to trigger the Appleby et al. fire sensor. For example, Appleby et al. is merely triggered by a temperature difference. In this regard, it may be assumed that any heat source such as an electric space heater, a steam release from a steam radiator or even steam from a coffee pot could trigger the Appleby et al. fire detector.

Since Appleby et al. uses heat to detect a fire, Appleby et al. teaches away from the use of “characteristic sounds emitted by a fire.” In addition, since there is no analysis of “characteristic sounds emitted by a fire” taught or suggested by the combination of Yokoi et al. and Appleby et al., the combination fails to teach or suggest each and every claim limitation. Since the combination fails to teach or suggest each and every claim limitation, the rejections are improper and should be overturned.

B. Claims 8, 14, 16, 28 and 29 have been rejected under 35 U.S.C. §103(a) as being obvious over Yokoi et al. in view of Appleby et al. and U.S. Pat. Appl. No. 6,295,346 to Markowitz

et al. It may be noted in this regard, that claims 8, 14, 16, 28 and 29 are dependent upon claims 1, 11 and 25, respectively, and that, therefore, claims 8, 14, 16, 28 and 29 are limited to “characteristic sounds emitted by a fire.”

It may be noted next that Markowitz et al. is limited to speech recognition software. As such the combination of Yokoi et al., Appleby et al. and Markowitz et al. fails to provide any teaching or suggestion of any system that analyzes “characteristic sounds emitted by a fire.”

Since Yokoi et al., Appleby et al. and Markowitz et al. all fail to provide any teaching of any analysis of “characteristic sounds emitted by a fire”, the combination fails to teach or suggest each and every claim limitation. Since the combination fails to teach or suggest each and every claim limitation, the rejections are improper and should be withdrawn.

C. A Prima facie Case of Obviousness Has Not Been Established. The Federal Circuit has continually held that the Examiner has the burden under 35 U.S.C. §103 of establishing a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992); In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). This burden may be satisfied only by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art would lead that individual to the claimed invention. For example, as the Federal Circuit has held recently, as well as on numerous other occasions: “[t]here must be some reason, suggestion or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination.” In re Oetiker, *supra*, 24 USPQ2d at 1446.

Moreover, the mere fact that the prior art references could be modified in the manner proposed by the Examiner would not have made the modification obvious unless there is some

motivation or suggestion in the prior art to do so. In re Gordon, 773 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984), also see In re Fritch, 972 F.2d 1260, 23 USPQ2d 1781, 1783 (Fed. Cir. 1992) (The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification).

When making an assessment of the obviousness of the claimed invention, the prior art, viewed as a whole, must "suggest the desirability, and thus the obviousness, of making the combination." In re Beattie, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992), quoting Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). Similarly, the Examiner, under §103, must consider the claimed subject matter "as a whole". In assessing the claimed subject matter "as a whole", the results and advantages of the claimed invention must be considered. Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 USPQ2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 USPQ2d 143 (Fed. Cir. 1987).

It is incumbent upon the Examiner to demonstrate that the proposed combination of reference teachings is proper. Where no express teaching or suggestion is apparent from the references, the Examiner must establish, with evidence or reasoning, why one skilled in the art would have been led by the relevant teachings of the applied references to make the proposed combination. In re Gordon, 773 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); ACS Hospital System, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 USPQ 929 (Fed. Cir. 1984). When making an obviousness rejection, "[i]t is impermissible, however, simply to engage in hindsight reconstruction of the claimed invention, using the applicant's structure as a template", In re Gorman, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Applicant submits that it does not require a close examination of the record to determine that the Examiner has failed to meet the burden of establishing a prima facie case of obviousness. On a first level, there is no teaching or suggestion, whatsoever, of the use of “characteristic sounds emitted by a fire” for fire detection within any of the cited references of Yokoi et al., Appleby et al. or Markowitz et al.

Moreover, even assuming *arguendo* that there were some teaching or suggestion of “characteristic sounds emitted by a fire” within Yokoi et al., Appleby et al. or Markowitz et al. (which there is not), there is still no nexus between the claimed invention and the cited references. The claimed invention teaches of an integrated system that uses microphones to detect fire as well as personnel within a region R. Nowhere within any of the cited references is there any comparable concept.

None of the cited references are directed to the use of “characteristic sounds emitted by a fire.” None of the cited references use an integrated system of sound detectors to detect fires and personnel. None of the cited references filter fire sounds from ambient sound to enhance the ability to detect personnel in a fire situation. Since there is no recognition of the problems solved by the claimed invention, there would be no reason to combine or otherwise modify the references in any manner similar to that of the claimed invention. As such, the combinations of Yokoi et al., Appleby et al. and Markowitz et al. fail to provide any teaching or suggestion of the claimed monitoring systems.

In general, the Examiner has failed to establish any credible basis why one skilled in the art would have been led by the relevant teachings of the applied references to make the claimed invention. For the foregoing reasons, allowance of claims 1, 2, 6-11, 14, 16, 25 and 27-29 as now

presented, is believed to be in order. It is respectfully requested that this Board reverse the decision of the Examiner in all respects.

Respectfully submitted,

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VIII. APPENDIX OF THE CLAIMS

Claims

1. (Rejected) A system comprising:

a plurality of audio modules,

at least one module of the plurality of audio modules including at least one audio output transducer and at least one audio input transducer;

a common control unit in communication with the plurality of audio modules;

an output device coupled to the control unit, the control unit presents at least audio information received at various of the modules, via the output device, with the presented audio indicative of the presence of individuals or selected environmental conditions in the vicinity of the respective module; and

which includes at least one of circuitry or software to automatically analyze audio of characteristic sounds emitted by a fire and received at the control unit with respect to at least one fire signature, to establish if an alarm condition is present in the vicinity of at least one of the modules.
2. (Rejected) A system as in claim 1 which includes an audio input device, at the control unit for transmitting audio messages to be output by transducers in at least some of the audio modules.

3-5. (Canceled)

6. (Rejected) A system as in claim 1 which includes at least one of circuitry or software to identify the at least one audio input transducer.

7. (Rejected) A system as in claim 1 which includes at least one of circuitry or software to filter fire related noise if combined with voice.

8. (Rejected) A system as in claim 1 which includes speech recognition software for processing received audio.

9. (Rejected) A system as in claim 1 where at least some of the plurality of modules include thermal sensors.

10. (Rejected) A system as in claim 9 including software for processing thermal related signals received from at least some of the thermal sensors of the plurality of modules.

11. (Rejected) A method of monitoring a region comprising:
sensing audio signals from spaced apart locations in the region;
automatically analyzing the sensed audio signals and responsive to recognizing an audio fire signature of characteristic sounds emitted by a fire, displaying locations of origination therefore.

12-13. (Canceled)

14. (Rejected) A method as in claim 11 which includes recognizing sounds of individuals at one or more locations in the regions.

15. (Canceled)

16. (Rejected) A method as in claim 11 which includes suppressing fire sounds from at least some of the sensed audio signals in order to more effectively recognize other sources of sound.

17-24. (Canceled)

25. (Rejected) A system comprising:

- a plurality of audio input transducers;
- at least one audio output transducer;
- a control unit in communication with the output transducer and the plurality of input transducers;
- a user interface device coupled to the control unit;
- the control unit presents at least location related audio information, received at various input transducers, via the interface device with the presented audio indicative of the presence of individuals or certain environmental conditions in the vicinity of the respective module; and

where the control unit analyzes and evaluates received audio of characteristic sounds emitted by a fire with respect to at least one fire signature.

26. (Canceled)

27. (Rejected) A system as in claim 25 where the control unit uniquely identifies each of the audio input transducers.

28. (Rejected) A system as in claim 25 where the control unit suppresses fire sounds in order to more effectively detect human voice.

29. (Rejected) A system as in claim 25 which includes speech recognition software for processing received audio.

30-33. (Canceled)

IX. EVIDENCE APPENDIX

No evidence has been submitted with this appeal.

X. RELATED PROCEEDINGS INDEX

There are no proceedings related to this appeal.